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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,086	12/30/2005	Satoshi Tamano	1141/75586	8130

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NEW YORK, NY 10036

EXAMINER

BOR, HELENE CATHERINE

ART UNIT	PAPER NUMBER
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3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/563,086

Applicant(s)

TAMANO ET AL.

Examiner

Helene Bor

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/30/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because:
 - a. Fig. 1, 102 & 103 – labeled reads “Probe”; --Probe--
 - b. Fig. 1, 106 – labeled “Connection Changeover Switch”; --Connection Control Circuit--
 - c. Fig. 1, 105 & 106 – both elements labeled as with the same name
 - d. Fig. 1, 104 – labeled “Transducer Elements m”; --Vibrator Elements--
 - e. Fig. 1, 702 – labeled “Receiving Circuit”; --Reception Circuit--
 - f. Fig. 6 – Reference labels needed for Display Field Area, Probe Tip Region, Gaster Wall, and Gaster Wall Blood Vessel Running.
2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New

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Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
 - g. Page 2, Line 23-24 – “conventional body cavity use ultrasonic probe”, no suggested correction, meaning unclear. Revision requested.
 - h. Page 2, Line 24-25 – “by a member having flexibility”, more appropriately --by a flexible member--
 - i. Page 3, Line 26 – “while mechanically fixing correctly”, no suggested correction, awkward word usage. Revision requested
 - j. Page 5, Line 12 – the constant in the equation “a” is not defined
 - k. Page 5, Line – first math symbol unclear, -- := --
 - l. Page 24, Line 1 – “witch”; --switch--
 - m. Page 31, Line 11 – “image taking”; more appropriate --imaging--Appropriate correction is required.

Oath/Declaration

4. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing address or post office address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76. Both the residence address and the post office address are required. See MPEP §§ 605.02 [R-5] and 605.03 [R-2].

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 6 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6, Line 25 states, "is one." It is unclear and indefinite as to what element "is one" is referring to such as the switch or the vibrator, or if the switch is sending out a signal of one [in comparison to sending a signal of zero].

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1-2, & 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hossack'248 et al. (US Patent No. 6,171,248 B1).

Claim 1: Hossack'248 teaches an ultrasonic probe, which includes an insert section (Figure 1, Element 10) to in body cavity (Col. 1, Line 52) and a handle section

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(Figure 1, Element "to handle"). Hossack'248 teaches a plurality of ultrasonic transducer elements [vibrator elements] (Col. 4, Line 14-15) at the tip of the insert section around entire 360 degree outer circumference (Figure 1 & Col. 4, Line 32-35). Hossack'248 teaches a system controller [connection change over switch] (Figure 4, "system controller") in the handle section. When looking at the relationship Figure 1 has with Figure 4, the system controller would be located in the "to handle" section of Figure 1. The system controller provides input to the beamformer (Figure 1, Element 102). Hossack'248 teaches transmit-receive elements combinations from the beamformer, which includes both transmit and receive (Col. 5, Line 62-63). Hossack'248 teaches the electrical connection of a predetermined number of vibrator elements among the plurality of vibrator elements to be connected with a predetermined number of ultrasonic wave transmission and reception channels for transmitting and receiving ultrasonic wave signals in an ultrasonic diagnostic apparatus main body (Col. 5, Line 50 – Col. 6, Line 32).

Claim 2: Hossack'248 teaches an ultrasonic probe, which includes an insert section (Figure 1, Element 10) to in body cavity (Col. 1, Line 52) and a handle section (Figure 1, Element "to handle"). Hossack'248 teaches a plurality of ultrasonic transducer elements [vibrator elements] (Col. 4, Line 14-15) at the tip of the insert section around entire 360 degree outer circumference (Figure 1 & Col. 4, Line 32-35). Hossack'248 teaches a system controller [connection change over switch] (Figure 4, "system controller") in the handle section. When looking at the relationship Figure 1 has with Figure 4, the system controller would be located in the "to handle" section of Figure

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1. The system controller provides input to the beamformer (Figure 1, Element 102).

Hossack'248 teaches transmit-receive elements combinations from the beamformer, which includes both transmit and receive (Col. 5, Line 62-63). Hossack'248 teaches the electrical connection of a predetermined number of vibrator elements among the plurality of vibrator elements to be connected with a predetermined number of ultrasonic wave transmission and reception channels for transmitting and receiving ultrasonic wave signals in an ultrasonic diagnostic apparatus main body (Col. 5, Line 50 – Col. 6, Line 32). Hossack'248 teaches using the ultrasonic transmission and reception signals for computing ultrasonic images (Figure 4). Hossack'248 teaches an ultrasonic wave image computing circuit (Figure 4, Element 138, 140, 142, 136, 149 & 146).

Hossack'248 does not use the words “blood flow image” and “tomogram.” However, Hossack'248 does teach an apparatus capable of collecting motion/tracking information [such as blood flow]. In addition, Hossack'248 does teach an apparatus for collecting multiple two-dimensional image data to form a three-dimensional volume [tomography] (Col. 5, Line 11-16 & Line 19-23).

Claim 6/2: The claim is rejected as best understood by the examiner.

Hossack'248 teaches an ultrasonic diagnostic apparatus wherein the transducers [vibrators] cover about 90 degrees over the outer circumferential face at the tip of the insert section (Figure 10, Element 502).

Claim 7/2: Hossack'248 teaches an apparatus allows for view select or image selection circuit (Figure 4, “view select” & Col. 6, Line 45-47).

Claim 8/2: Hossack'248 teaches an apparatus that can adjust according to the depth of penetration (Col. 9, Line 20-31 & Line 54-62).

Claim 9/2: Hossack'248 teaches an apparatus includes an image display unit (Figure 6, Element 146). Hossack'248 does not use the words "blood flow image" and "tomogram." However, Hossack'248 does teach an apparatus capable of collecting motion/tracking information [such as blood flow]. In addition, Hossack'248 does teach an apparatus for collecting multiple two-dimensional image data to form a three-dimensional volume [tomography] (Col. 5, Line 11-16 & Line 19-23). Hossack'248 also teaches an apparatus capable of displaying the outputs from the computing circuits (Col. 6, Line 38-47).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claim 3-5 & 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack'248 (US Patent No. 6,171,248) and in further view of O'Donnell'892 (US Patent No. 5,291,892).

Claim 3/2: Hossack'248 teaches an apparatus a beamformer system/signal detector [connection change over switch] controls the transmission and reception channels with the transducers [vibrators] (Col. 5, Line 63 – Col. 6, Line 5). Hossack'248 also teaches the turning ON and OFF of the transducers [vibrators] (Col. 5, Line 58-63). While Hossock'248 describes waiting for all the signals to be received and the data are delayed and summed to produce a beamformed signal, Hossack'248 does not go into detail regarding the time delays. However, O'Donnell'892 goes into further detail regarding the time delay (Col. 5, Line 39-60) and reference to the center for receiving (Figure 10, Element R & 38). The respective times of the time delay being determined by the beamformer system/signal detector. It would have been obvious to one of ordinary skill in the art to combine the teachings of Hossack'248 and O'Donnell'892 in order to indicate total flow velocity in the two-dimensional plane of the image and the direction of that flow (Col. 4, Line 35-33).

Claim 4/3/2 & Claim 5/3/2: Hosack'248 teaches the time delay and channels are set unchanged (Col. 5, Line 58 – Col. 6, Line 12). In addition, Hossack'248 teaches the time delay and channels are set changeable at respective times (Col. 6, Line 12-33).

Claim 10/4/3/2: Hossack'248 teaches sequential mode [the turning on and off of vibrators in a sequence] for the transmit-receive elements of the ultrasound system.

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Claim 11/5/3/2: Hossack'248 teaches sequential mode [the turning on and off of vibrators in a sequence] for the transmit-receive elements of the ultrasound system.

Claim 12/10/4/3/2: Hossack'248 teaches an apparatus wherein the beamformer system/signal detector [connection change over switch] shifts the scanning direction by the ultrasonic wave signals over the entire 360 degree circumference (Col. 5, Line 50-Col. 6, Line 12, Col. 6, Line 33-38 & Col. 8, Line 11-12).

Claim 13/11/5/3/2: Hossack'248 teaches an apparatus wherein the beamformer system/signal detector [connection change over switch] shifts the scanning direction by the ultrasonic wave signals over the entire 360 degree circumference (Col. 5, Line 50-Col. 6, Line 12, Col. 6, Line 33-38 & Col. 8, Line 11-12).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- a. Angehrn; Jorg A. Method and apparatus for ultrasonic scanning of a borehole having improved sensor array and timing circuit, 11/17/1992. US 5164548 A.
- b. Barlow; Christopher J. et al. Ultrasonic transducer arrangement and catheter, 10/10/1995. US 5456259 A.
- c. Bele; Robert et al. Ultrasonic imaging device in which electroacoustic transducers are disposed on a convex probe, 07/02/1991. US 5027659 A.
- d. Dias; Fleming et al. Method and apparatus for phased array coupling ultrasonic energy into an acoustic waveguide wire. 04/23/1996. US 5509417 A.

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e. Eaton; John W. et al. Ultrasonic catheter, system and method for two dimensional imaging or three-dimensional reconstruction, 03/02/1999. US 5876345 A.

f. Hara; Makoto. Image display system, 11/11/1997. US 5685311 A.

g. Ohara; Kenichi et al. Radial scan, forward viewing ultrasonic endoscope, 01/28/2003. US 6511431 B2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Bor whose telephone number is 571-272-2947. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on 571-272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

hcb


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